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Cemented hemi arthroplasty for unstable intertrochanteric fractures in elderly

Y. V. S. Prabhakar, Venkat Sivaram G. V.*, R. K. L. Jaiswal

Department of Orthopedics, Malla Reddy Institute of Medical Sciences, Hyderabad, Telangana, India

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***Correspondence:**
Dr. G. V. Venkat Sivaram,
E-mail: gvvsivaram@gmail.com

ABSTRACT

Background: The incidence of the intertrochanteric fractures is increasing in recent times. It is found that more and more of these fractures are seen in elderly. The treatment of these fractures was historically non surgical. The use of dynamic hip screw and angled blade plate in the surgical management of these fractures is a recent practice. The objective of the study was to analyse the role of cemented hemi-arthroplasty in the treatment of unstable inter trochanteric fractures in elderly.
Methods: This study was conducted between June 2014 to June 2016. Results were analysed prospectively. From a total 94 inter trochanteric fractures admitted during this period 20 patients were chosen who fulfilled our inclusion criteria. All the patients were treated in Malla Reddy Institute of Medical Sciences. Primary cemented hemiarthroplasty was done in the entire patient by a senior faculty member. The results were assessed according to Harris hip score.
Results: There were 13 females and 7 males in our study. The average age was 69.2 years. There was Evan's type 1-c 11, 1-d 7 and 1-e 2 in numbers all the patients were followed up for a period of 18 months.
Conclusions: In our short study, it is concluded that the primary cemented hemi arthroplasty is a good option in unstable inter trochanteric fractures in elderly.

Keywords: Unstable, Inter trochanteric, Fractures, Elderly

INTRODUCTION

The incidence of inter trochanteric fractures is increasing in the recent times. With increased population of the aged these fractures have become a huge public health issue. It is also found that the incidence of these fractures is found to be shifting to the right with time i.e. more and more of these fractures are seen in elderly.[1,2]

The treatment of these fractures was historically conservative or non- operative. Operative fixation using fixed angle blade plate and sliding hip screw is a fairly recent practice. The conservative treatment with skeletal traction and prolonged immobilisation was associated with the complications like deep vein thrombosis, joint stiffness, and decubitus ulcers, pulmonary and cardiac problems. Fractures with stable configuration do well with the conventional osteosynthesis, but those with unstable configuration i.e. Evan's type I-c, I-d and I-e result in implant failure and collapse of the bone and cut through the bone etc.[3]

The fixations were successful when the quality of bone was good but in elderly individuals with osteoporosis these were bound to fail. The cephalo-medullary devises circumvented these issues successfully. But when early mobilisation was done the nails broke resulting in complications. Prosthetic replacement of femoral head

and neck appears to be an alternative, for early ambulation and rehabilitation of the elderly individuals. This considerably reduces the morbidity and mortality.[4,5]

The purpose of this study is to analyse the results of cemented hemiarthroplasty in elderly individuals with unstable intertrochanteric fractures.

METHODS

This study was conducted from June 2014 to June 2016 at Department of Orthopedics, Malla Reddy Institute of Medical Sciences. Results were analysed prospectively. From a total 94 inter trochanteric fractures admitted during this period 20 patients were chosen who fulfilled our inclusion criteria.

The inclusion criteria were- patients more than 65 years of age with no upper limit, unstable intertrochanteric fracture of Evans type 1-c, 1-d and 1-e and a follow up period of minimum 18 months.

No DEXA scan for bone mineral density assessment was done in our series. The exclusion criteria included patients below 65 years, poly trauma, fractures in both hips, patients who had surgery in the opposite hip earlier, and patients who were lost to follow up before 18 month after surgery. 20 patients who satisfied our criteria were selected for our study, and followed up for minimum period of 18 months.

There were 13 females and 7 males in our study. The average age was 69.2 years with the minimum being 65 and the oldest patient was of 90 years of age. Slip and fall from a standing position was the most common mode of injury. Hypertension and diabetes mellitus were the most common co morbidities in our patients. The average time lapse between injury and surgery was 6 days excluding one patient who presented 2 months after injury with a cut through of the DHS screw.

Inclusion criteria

Inclusion criteria were patients more than 65 years of age; unstable intertrochanteric fracture of Evans Type type 1-c, 1-d and 1-e.

Surgical procedure

The surgeries were done by senior orthopaedic surgeons in all the cases. The procedure is done by Moore's approach in a lateral decubitus position. The fascia lata is cut and opened and the femoral attachment of gluteus maximus identified. The gluteus maximus was split and retracted. The fractures in the greater trochanter are defined and the greater trochanter is retracted proximally. The capsule is opened after cutting the small external rotators. The head and neck are extracted and the appropriate size of the implant identified. Trial reduction is made to know the vertical and horizontal off set. Two holes are made parallel to each other at the proximal end of the femoral shaft on the lateral aspect. An SS wire is passed through them inside out technic so that the loose ends lie outside in the wound.

The acetabulum is prepared after removal puvinar and remnants of the ligamentumteres. The femoral shaft was prepared with appropriate reaming and kept dry.

The antibiotic laden bone cement is prepared introduced into the canal in a retrograde fashion using a second generation method

The selected prosthesis is driven home taking into account the version of femoral neck, the vertical and horizontal off set. The calcar is made out of the cement and the neck of the prosthesis is seated on the cemented calcar. No attempt is made to repair the lesser trochanter. Where greater trochanter was found to be severely comminuted; here ethibond sutures were used to suture together the trochanter pieces and the soft tissue to make a stable construct. The gluteus medius, greater trochanter, and the vastuslateralis apparatus were maintained in continuity as a stable lateral sleeve. This was then fixed loosely to the shaft fragment with steel wires or ethibond sutures.

An SS wire is now passed through the gluteus medius and the greater trochanter is pulled down and sutured to the SS wire ends that were placed earlier in the proximal end of femur when the greater trochanter is not comminuted it is attached using no 2-o ethibond.

The hip is now reduced and stability is tested. The wounds are closed over drain. The average time for surgery was 73.8 mts and the average blood loss was 264 ml.

The sutures were removed on 12 post-operative days. The patient was made is made to sit after 24 hrs and weight bear on a walker after 48 hrs oras the pain is tolerated.

The patients were followed up at 3 weeks, 3 months, and 6 months and then every 6 months clinical assessment is done at every visit based on Harris Hip score and recorded.

Statistical analysis

The data was entered in Microsoft Excel worksheet, and analyzed using proportions.

RESULTS

A total of 20 patients of comminuted inter trochanteric fractures who passed the inclusion criteria were operated during a period of 2 yrs. There was Evan's type 1-c 11, 1-d 7 and 1-e 2 in numbers all the patients were followed up for a period of 18 months. All patients were walking independently before surgery. 16 patients had a fall at

home and 4 had a fall on the road due to unfamiliarity of the terrain. There were no road traffic accidents (Table 1).

Table 1: Distribution of cases as per the type of fall.

Type of fall	Number	%
Fall at home	16	80
Fall on the road	04	20
Road traffic accidents	0	0
Total	20	100

Table 2: General characteristics of the patients.

General characteristics	Number	%
Sex		
Male	7	35
Female	13	65
Co morbidities		
Hypertension	9	45
Hypertension + diabetes	6	30
No co morbidities	5	25

The average age of the patients was 69.8 years. There were 7 males and 13 female patients. 9 of our patients had co morbidities of hypertension, 6 had both hypertension and diabetes mellitus and rest had no co morbidities. The average delay from admission to surgery was 10 days, due to correction of the co morbidities and making them fit for anaesthesia. The average duration of surgery was 73.55 minutes and the average blood loss was 264 ml. All the patients were transfused compatible blood after surgery in view of the elderly age group of these patients. Our patients were made to stand and walk on an average on 4th post-operative day. Average stay in the hospital was 15.2 days (Table 2).

We had encountered one post-operative dislocation, which also had a superficial infection and a bed sore. Eventually the patient had a poor result because of Parkinsonism, and noncompliance with physiotherapy. There was wire breakage as a late complication in 4 patients. Seven of our patients developed a limb shortening ranging from 1 cm to 2 cm.

All patients were assessed according to Harris hip score at discharge, at 6 weeks 3 months, 6 months 1 year and 18 months.

Table 3: Outcome at the follow up period of 18 months.

Outcome	Number	%
Good	13	65
Fair	04	20
Excellent	02	10
Poor	01	05
Total	20	100

At the end of 18 months our results were assessed to be 13 good, 4 fair and 2 excellent. One patient was assessed as poor at 3 months follow up and continued to be poor on subsequent visits. All our patients were walking with help of a cane at the end of 18 months. We had insisted on use of a cane in view of the advanced age and possible other co-morbidities like visual, balance and postural disorders to prevent falls. All our patients had abduction lurch at 6 months follow up but they subsequently improved. Four of the patients who were shown as fair result remained with a residual lurch. Incidence of acetabular erosions and loosening of the prosthesis is not reported in our series. None of our patients had a revision surgery (Table 3).

DISCUSSION

In our study we have treated 20 patients with unstable inter trochanteric fractures with primary cemented hemi arthroplasty using a bipolar prosthesis. We assess our results according to Harris hip score at the end of 18 months of follow up.

We report a 17 (85%) good to fair results, 2 (10%) excellent results and 1 (5%) poor results. Thus the results of this modality of treatment look very encouraging avoiding the complications associated with conservative management and internal fixation of these unstable inter trochanteric fractures in elderly.

Reconstruction of the greater trochanter with circlage wire is the key to the postoperative stability and early mobilisation of the patient. In our series we fixed all the fractures of the greater trochanter using a stainless steel wire.

The primary cemented hemiarthroplasty is a promising modality of treatment of these patients who are elderly, with unstable inter trochanteric fractures. It affords an early mobilisation circumventing the complications of bed sores, pneumonias, atelectasis and DVT. It also avoids the complication of loosening of the implants, cut through and non-union of the fractures treated by osteosynthesis.

Early surgery with early mobilisation is the key to the success of these fractures.

White et al reported that he inter trochanteric fractures in elderly are associated high morbidity and mortality. The use of internal fixation has largely reduced the morbidity. This report is in accordance with the findings of the present study.[6]

Sternbo et al noticed that early mobilisation is still not advised due to fear of implant failure in comminuted fractures, osteoporotic bones. In the present study we got encouraging results.[7]

Stern et al said that it is imperative that early mobilisation is encouraged in order to avoid the complications associated with prolonged immobility.[8] The cemented hemiarthroplasty provides both good fixation and early mobilisation. This observation is in accordance with the findings of the present study.[8]

There are several Indian studies of inter trochanteric fractures treated by primary hemi arthroplasty.[9]

Tronzo et al claimed to be the first to use long, straight-stemmed prosthesis for the primary treatment of intertrochanteric fractures.[10] Since then there were several studies reporting good results in unstable intertrochanteric fractures in elderly.

Rosenfeld et al reported good results with the use of the Leinbach prosthesis.[11] We also found that 17 (85%) good to fair results, 2 (10%) excellent results.

Stern et al used the Leinbach prosthesis in the primary treatment of unstable intertrochanteric fractures and reported an early ambulation and return to normal activity in 22 of his patients.[12] This observation is in accordance with the findings of the present study.[12]

Grimsrud et al reported the results of 39 consecutive inter trochanteric fractures and concluded that the fractures can be treated with the standard femoral stems and circulate wiring of the trochanter. The procedure is safe and easy. It affords stability and early mobility.[13]

Rodop et al in a study of primary bipolar hemiprosthesis for unstable intertrochanteric fractures in 37 elderly patients obtained 17 excellent (45%) and 14 good (37%) results after 12 months according to the Harris hip-scoring.[14] We also found that 17 (85%) good to fair results, 2 (10%) excellent results.[14]

Limitations

Our small sample size and short term follow up restrain us from making any conclusion on the mortality, infectionrate, loosening and failure of implamt, and necessity for a revision procedure in these patients.

CONCLUSION

Osteosynthesis with either a DHS or an intramedullary device is a popular procedure for inter trochanteric fractures. The use of primary cemented hemi arthroplasty is a very promising procedure for early mobilisation and weight bearing in elderly individuals avoiding most of the complications associated with osteosynthesis.

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